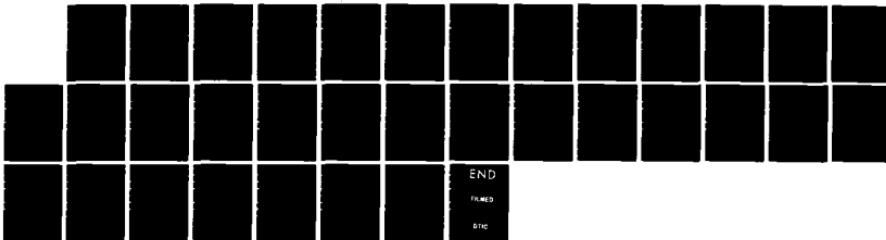


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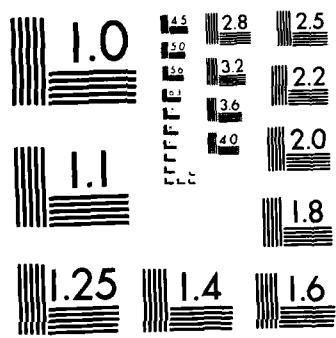
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POLAND'S MOUNTAIN OF DEBT: WILL IT DWINDLE?

Keith Crane

May 1985

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POLAND'S MOUNTAIN OF DEBT: WILL IT DWINDLE?

Keith Crane

May 1985

per Mr. on file.

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I. INTRODUCTION

PURPOSE ¹

As the Polish and Western governments work out the details of rescheduling Polish arrears from 1982 to the present, Poland's hard currency debt problem has once more come to the fore. The Poles no longer have the luxury of ignoring the bulk of their obligations, their guaranteed debts. Yet they also are welcoming the prospect of potential new Western loans and entry to the IMF. These policy changes are occurring as Poland continues to struggle with its hard currency debt; despite substantial hard currency import reductions, the economy still fails to generate trade surpluses sufficient to cover interest due, let alone principal payments.

The purpose of this paper is to analyze Polish prospects to work out during the 1980s a feasible long-term strategy to gain control of the debt situation. The paper attempts to capture the policy options open to Poland, the Soviet Union and the West in the form of a series of scenarios, and then projects hard currency balance of payments and output for each scenario. A comparison of the projections provides a means by which the impact of alternative policies on Polish creditworthiness and output levels can be judged.

PROJECTIONS

The Balance of Payments

Due to the emphasis on creditworthiness in this paper, balance of payments were projected and then used to project output, instead of the more traditional approach of first focusing on domestic output. Increases in hard currency exports are assumed to be determined by growth in aggregate demand in Poland's hard currency export markets and by Polish hard currency export capacity. The former is represented by GNP growth in market economies, which is assumed to remain below the

¹ I would like to thank David Kemme, Laura Tyson, and two anonymous referees for many helpful suggestions and criticisms. All remaining errors remain mine alone.

rapid rates of the 1960s. Constraints on Polish export capacity are captured by using 1983 hard currency exports as a base and, in some scenarios, by projecting coal exports separately using Polish mining capacity figures.

Interest payments are projected using modifications of a series for U.S. AAA corporate bond rates for the 1980s to project rates on guaranteed and unguaranteed Polish loans.² These rates, which are high in historical terms, were multiplied by modified official Polish debt figures to project interest payments.³ Repayment schedules were taken from official Polish data, but have been modified by the addition of principal due from the reschedulings assumed in the scenarios.

Creditworthiness is assessed using traditional measures such as debt service and debt export ratios and a measure invented by Avramovic and further developed by Solberg called net compressible import capacity, a measure of the squeeze on a country's output caused by a reduction in imports.⁴

Net compressible import capacity is defined as the difference:

²The rates used are given in Crane, Keith, *The Creditworthiness of Eastern Europe in the 1980s*, R-3201, Santa Monica, The Rand Corporation, 1985.

³To estimate Polish debt levels, I have capitalized interest owed and included arrears on loans. Capitalized interest alone comes close to \$3 billion.

⁴Avramovic, Dragoslav, *Economic Growth and External Debt*, Johns Hopkins Press, Baltimore, 1964; and Solberg, Ronald, *Economic Foundations of Debt Service Capacity*, University of California, Berkeley, April, 1982.

$$NCIC = X - I - A - NCM + NER - CR, \quad (1)$$

Where NCIC equals net compressible import capacity,
X equals exports,
I equals interest payments,
A equals amortization,
NCM equals noncompressible imports,
NER equals new external resources obtained by the country, and
CR equals changes in reserves.

Except for NCM, the terms in Eq. (1) are self-explanatory. NCM, noncompressible imports, are an *ex ante* concept; they are defined as those imports policymakers reduce only when they have exhausted the policy options of reducing reserves, cutting other (compressible) imports, or increasing exports or loans. NCM can be likened to inputs in an input-output model; a reduction leads to a decline in output. In most economies these imports consist of raw materials and semimanufactures. In this model they also include some food.

The difference between earnings of foreign exchange and noncompressible expenditures, the sum of interest payments, amortization, and noncompressible imports equals the balance for compressible imports. This difference plus new loans or foreign investment equals net compressible import capacity, which measures the severity of the hard currency balance of payments constraint on the country's economy.

Most of Poland's debt is in hard currency, and the lack of imports from hard currency areas, rather than imports in general, constrains economic output,⁵ so this report projects *hard currency* net compressible import capacity, rather than total net compressible import capacity. Imports purchased for transferable rubles are considered to fall into a separate category.⁶

⁵Olechowski, Andrzej, "Katastrofa i ratunek," *Polityka*, #5, 20 March 1982, p. 20. Shortages of hard currency imports restrict capacity utilization in Polish industry because machines imported from the West often need imported inputs to operate, and constrains increased Polish manufactured exports to the West, necessary if Poland is to service its debt, because many Polish products are not competitive on world markets unless they include certain key components manufactured in the West.

⁶This implies that the elasticity of substitution of transferable ruble imports for hard currency imports is very low. Studies indicate

The 1980 level of nonagricultural imports is assumed to equal the noncompressible level, chosen because on the one hand Polish authorities made reducing the hard currency trade deficit a high priority in that year; imports were severely curtailed except for food and intermediate goods considered necessary to keep the population quiescent or to maintain industrial output levels. On the other hand, the reduction in output was primarily due to a decline in the output of the extractive industries; shortages of hard currency imports were not yet instrumental in the decline in industrial output. Noncompressible agricultural imports are assumed to be determined by the quantities necessary to maintain food consumption at levels considered minimal by the Polish government.⁷

Output

The effect of balance of payments pressures on output and consumption is addressed through the use of projections generated by a small sectoral macroeconomic model.⁸ This model differs from traditional models in that it incorporates hard currency imports as an input in the production process. In the United States, standard large-scale macromodels estimated with econometric techniques have generally been predicated on theoretical models in which output changes are primarily demand determined, although supply equations are included.⁹ These models often incorporate a trading sector, but their theoretical base tends to be a closed model.

Such models provide poor approximations to the reality of a centrally planned economy (CPE), like Poland's. First, CPEs are shortage economies in which macroeconomic control is exercised primarily through input controls rather than demand regulation, and thus models

this is the case for Poland (Kemme, David and Keith Crane, "The Polish Economic Collapse: Contributing Factors and Economic Costs," *Journal of Comparative Economics*, #8 Spring, 1984, p. 25).

⁷The determination of these quantities is described in Crane, Keith, *The Creditworthiness of Eastern Europe in the 1980s*, R-3201, Santa Monica, The Rand Corporation, 1985.

⁸ See Appendix A.

⁹Duggal, V. G., L. R. Klein, and M. D. McCarthy, "The Wharton Econometric Model Mark III: A Modern IS-LM Construct," *International Economic Review*, October 1974.

expressing economic activity as a function of demand rather than supply are inappropriate. Second, Poland is an open economy in the sense that a large proportion of output is traded. In contrast to small open market economies, however, Poland has restricted imports to noncompetitive imports--goods either not produced in the domestic economy or not produced in sufficient quantity to satisfy domestic demand. Consequently, changes in the level of imports greatly affect output, whereas output in market economies is determined to a greater extent by aggregate demand in domestic and export markets. Changes in output levels, however, do not necessarily have a similar effect on exports; exports can increase or decrease during times of economic decline depending on the objectives of the central authorities. Thus, neither closed models nor small open market economy models are suitable for modeling economic activity in a CPE.

The model employed here attempts to avoid these problems by making the output of the most important sector, industry, a function of hard currency imports. In turn, hard currency imports are a function of export earnings and debt service, which are assumed to be determined exogenously. Imports are then equal to:

$$\text{Expected Hard Currency Imports} = \text{HCE} - \text{I} - \text{A} + \text{L} \quad (2)$$

where HCE is hard currency earnings,
I is total interest obligations,
A is amortization (principal due), and
L equals loans and foreign investments.

The model is designed to make the linkages clear between supplies of hard currency imports, debt service obligations and net material product (NMP) and utilized national income (UNI), the goods and services consumed within the country, so that it is easy to trace the effects of the different hard currency import levels projected in the scenarios on NMP and UNI.

II. SCENARIO PROJECTIONS

SCENARIOS¹

Scenario 1: Muddling Through

The initial scenario, possibly the most probable, assumes that Polish policies will remain unchanged in the period to 1989. The Polish government will continue to opt for low rates of investment implying little change in industrial structure. Consequently, industry is assumed to remain fairly energy-intensive, and there will be no dramatic increase in supplies of coal available for export, especially as coal output will be limited by capacity constraints. Continued reluctance to use markets to set prices or to pay workers on the basis of output implies no surges in labor or capital productivity.

Soviet policies are assumed to be directed at eliminating Soviet assistance to Poland. The Soviets have forced Poland to reduce its deficit in transferable ruble trade every year between 1981, Solidarity's heyday, and 1983. It seems plausible that they will continue to press the Poles to reduce the deficit, most likely by requesting increased imports of Polish goods. Unfortunately, little information is available with regard to how long the Soviets will permit this deficit to exist. I have arbitrarily assumed that the deficit will be reduced linearly after 1984 until it disappears in 1988.

In this scenario relations with the West improve to the extent that 90 percent of Poland's debt owed or guaranteed by governments (Western, Third World and Soviet Bloc), is rescheduled in all years. Until 1986, 90 percent of interest on guaranteed loans is also assumed to be rescheduled.

¹For a more detailed discussion of the assumptions used to construct these scenarios see Crane, Keith, *The Creditworthiness of Eastern Europe in the 1980s*, R-3201, Santa Monica, The Rand Corporation, 1985.

Scenario 2: Successful Economic Reform

The Polish economic reform, introduced January 1, 1983, was designed to increase economic efficiency and decentralize economic control. These goals were to be attained by greater reliance on market forces and by increasing the independence of enterprises by giving workers a decisive role in enterprise decisionmaking through workers' councils. Enterprises were to be self-financing: Loss-making enterprises were to be allowed to go bankrupt.²

Such a reform ought to have greatly increased allocative efficiency in Poland; at a minimum, greater reliance on market forces ought to have eliminated excess demand on both consumer goods and labor markets. This has not occurred: Many consumer goods (meat, apartments, automobiles, etc.) continue to be allocated by ration cards or queue and the labor market is characterized by excess demand.³ Poland continues to be a "shortage economy."

The failure of the reform to this point has primarily been due to the reluctance of the Polish authorities to rely on market forces to set prices and determine what is to be produced. This reluctance stems from fears concerning the potential effect of markets on two important policy goals: reducing inflation and maintenance of full employment. Despite a rise in the cost of living of over 100 percent in 1982, the authorities have maintained price controls apparently because they believe inflation would have been even more rapid without them, and controls on the freedom of enterprises to set their own prices have been tightened since the introduction of the reform.

Equilibrium in markets has also been elusive because the government has subsidized loss-making enterprises through grants or loans, thereby forestalling any massive layoffs, but also eliminating much of the pressure on enterprises to alter the structure of production. Subsidies for enterprises, construction, and agriculture accounted for over 40 percent of the national budget in 1982. A substantial part of these

²"Ustawa o przedsiębiorstwach państowowych," *Trybuna Ludu*, XXXIII #227, 28 September 1981, p. 5.

³"The Third Poll of the KRG," *Zycie Gospodarczy*, #27, 3 July 1983, p. 1 in JPRS, #84256, 2 September 1983, p. 83.

subsidies was financed by money creation. For example, in 1983 the authorities planned on financing 7 percent of budgetary expenditures through money creation, contributing to excess demand.⁴

Instead of allocating increasingly scarce inputs through markets, the authorities have chosen to allocate resources administratively. Administrative measures have been especially prevalent in the allocation of foreign exchange and raw materials, and ad hoc measures have been used extensively for determining tax rates and subsidies. Consequently, enterprise managers have faced incentives other than bonuses tied to profits when making decisions. They have found it expedient to apply for subsidies, lobby for supplies of inputs, and manipulate tax and price regulations to increase earnings rather than pursue profits through changing product lines or altering production technologies. Thus, the ad hoc application of the instruments established in the reform has reduced incentives for managers to use inputs more efficiently and change their output mix to better correspond to demand; they have imposed substantial efficiency costs on the country. These measures have also greatly limited the incentives for enterprises to export because the domestic market is more profitable.⁵

The switch from evaluating enterprise managers on the basis of output to profits, and attempts to use market-clearing prices have, however, provided the authorities with the instruments to eliminate these problems, if they so desire. A devaluation of the zloty, greater use of market prices, and a "harder" budget constraint for enterprises could quickly bring equilibrium to the domestic market, especially if domestic monopolies were broken up by removing barriers to entry for all firms: state, cooperative, or private. Excess demand could also be quickly reduced if sales of franchises for retail stores and restaurants on the line of the Hungarian reform were increased, as well as further sales of poorly utilized state-owned land to private farmers, because much of the monetary overhang in the Polish economy is assumed to be in the hands of the Polish private sector or the peasants.

⁴Fallenbuchl, Zbigniew, "The Polish Economy Under Martial Law," 1983, mimeo.

⁵According to many Polish economists and enterprise managers the zloty remains substantially overvalued (*Rzeczpospolita*, 1 July 1983, p. 1).

This scenario assumes these changes are implemented and the economic reform takes root increasing factor productivity growth and the export orientation of the Polish economy. All the assumptions of the base case are maintained except that Polish exports to market economies increase by 12.6 percent per year in real terms, the rate of increase recorded in 1983,⁶ and the rate of increase in labor productivity is assumed to be 2.2 percentage points per year higher than in the base case. This increase in labor productivity is the same recorded in Hungary following the introduction of the 1968 reform.⁷

This scenario has a low probability.

Scenario 3: Elimination of the Soviet Trade Deficit

Despite frequent references in the Polish press to the assistance supplied by the other members of the CMEA during the economic crisis, the extent of this assistance has been much less than originally hoped. No help was forthcoming from the other East European members of the CMEA during 1982, the year in which the Polish economy reached its nadir. Only the Soviet Union has provided Poland with considerable help; the Soviets provided hard currency loans during 1981 (when Solidarity was active) and allowed Poland to run a trade deficit of 1620 million transferable rubles in that year. The Soviets reduced their trade surplus with Poland sharply in 1982, however, to 620 million transferable rubles, less than 40 percent of the 1981 deficit.⁸ This process continued in 1983 when the deficit was further reduced to less than 600 million rubles.⁹ This may have been somewhat of a surprise to

⁶"Handel Zagraniczny '83," *Zycie Gospodarcze*, #6, 5 February 1984, p. 8.

⁷This is the difference in the average annual rate of increase in labor productivity between 1960 and 1967, the period immediately preceding the Hungarian reform, and 1968 to 1973, the period immediately following its implementation.

⁸Glowny Urzad Statystyczny, *Rocznik Statystyczny Handlu Zagranicznego (RSHZ)*, Glowny Urzad Statystyczny, Warsaw, various years.

⁹Surpluses in ruble trade in services of 150 million and 280 million rubles in 1981 and 1982, respectively, have helped to offset these deficits. "Handel Zagraniczny '83," *Zycie Gospodarcze*, No. 6, 5 February 1984, p. 8.

Several lessons can be drawn from the output projections in this scenario. First, the imposition of martial law and the subsequent refusal of the West to grant additional credits to Poland have been costly in terms of forgone output.²³ Second, Poland would derive substantial economic benefit from reconciliation with the West, if it simultaneously obtained new loans. Third, Western negotiators ought to have a fairly strong position from which to bargain for economic terms for renewing ties. Past experience indicates, however, that this Polish government is prepared to pay extremely high economic costs to hold onto political power, so political concessions are likely to be granted grudgingly, if at all.

Moratorium. In the short run Poland benefits from this scenario. By diverting hard currency export earnings from servicing guaranteed debt to increasing hard currency imports, Poland increases NMP by over 3 percent in the mid-1980s. Despite the increases in consumption in earlier years, however, output at the end of the period is lower than in the base case.

This scenario demonstrates the tradeoffs facing the Polish leadership; it is not a promising one. On the one hand, a continued moratorium on servicing debt owed or guaranteed by Western governments could lead to substantial short run increases in consumption and investment. On the other hand, when the Polish leadership finally begins to service the debt, Poland will still be in the position it is in today: bankrupt and mired in a period of slow economic growth because of its debt obligations. The Polish government may find it more

²³Recent articles in the Polish press have attempted to quantify losses due to economic sanctions ("Miliardowe straty z powodu restrykcji amerykańskich," *Zycie Warszawy*, 12-13 November 1983, #269, p. 1). These studies have assumed that the West ought to have agreed to further loans and to business as usual after the imposition of martial law. The logic of this assumption is certainly questionable. Even before the imposition of martial law the flow of funds to Poland was substantially reduced. This was part of the process of balance of payments adjustment. Since Poland was bankrupt when the state of war was declared, there were no financial reasons for continuing to provide loans especially, as the state of war, which was in direct violation of the Helsinki accords, destroyed any political rationale for supporting the Polish regime. Consequently, the "costs" of the sanctions as calculated by the Poles are based on faulty premises.

growth the 1980s will probably be a lost decade for the Polish economy.

No Soviet Trade Deficit. Output is somewhat lower in this scenario than in the base case because of the decline in hard currency imports caused by the diversion of exports from Western markets to the Soviet Union. By 1989 output is .3 percent less than in the base case; the rate of growth falls by .1 percentage points to 4.5 percent per year.

The only damage of note occasioned by the need to increase exports to the Soviet Union is felt in utilized national income. In 1985 UNI is 1.2 percent less than in the base case, but this declines to a difference of 1.1 percent in 1986 and .4 percent in 1989. Under the assumptions of this scenario, the effect of closing the trade deficit with the Soviet Union on Polish output and UNI would be minor.

Reconciliation. Output and UNI fare much better in this scenario than in the base case. By 1989 NMP is about 2 percent more and absorption, 1.6 percent more than in the initial scenario. The increase in absorption is especially great in 1985, the year in which the loans are granted; consumption and investment increase by almost 10 percent compared with the base case. If this increase could be channeled toward productive investments, increases in output and absorption in later years would be even greater.

Table 5
UTILIZED NATIONAL INCOME PROJECTIONS

Year	1979=100					
	Initial	Reform	No Soviet Deficit Case	Reconciliation	Moratorium Scenario	Default Scenario
1985	95.0	97.4	93.9	104.3	96.1	92.0
1986	85.2	90.2	84.2	84.7	93.3	95.5
1987	90.8	98.5	90.1	91.0	98.0	99.3
1988	96.4	107.0	96.0	97.3	103.1	102.8
1989	101.5	115.4	101.1	103.1	100.5	84.7

Table 4
NET MATERIAL PRODUCT PROJECTIONS

1979=100						
Year	Initial	Reform	No Soviet Deficit Case	Reconciliation	Moratorium Scenario	Default Scenario
1985	95.7	98.1	95.3	99.3	96.1	90.8
1986	94.1	99.0	93.6	94.4	97.7	94.8
1987	99.2	106.8	98.8	100.2	102.5	99.0
1988	104.5	115.0	104.2	106.1	107.5	103.4
1989	109.5	123.3	109.2	111.8	109.2	95.4

Successful Economic Reform. Increased imports made possible by faster rates of export growth and higher labor productivity provide Poland with 12.5 percent more output in 1989 than in the base case. Over the course of the period output grows at 6.8 percent per year, which is more than 2 percentage points greater per year than the 4.6 percent rate in the initial scenario. Although this rate is substantially below the average rate of the early 1970s (9.8 percent), it is impressive for the 1980s when many centrally planned economies have seen output stagnate or fall. However, these increases must be considered in the light of the declines Poland experienced between 1979 and 1982; in this scenario Polish NMP still remains below 1979 levels until 1987.

In 1989 utilized national income is 13.8 percent greater in this scenario than in the base case. This ought to leave more room for the central authorities to increase investment, which could lead to even higher rates of growth in subsequent years. Living standards and investment levels remain below 1979 levels until 1988, however, indicating that even under the best of conditions a recovery in investment and output will be slow. Real per capita consumption is unlikely to regain its previous peak until 1989. Under these assumptions Poland may be in a position to pursue export-led growth in the 1990s; however, output and UNI will grow so slowly that in terms of

Because of the much lower rate of growth assumed for hard currency exports in this scenario and the massive increases in hard currency debt, creditworthiness indicators deteriorate greatly. Poland fails to make interest payments on its debt, so these are amortized and total debt increases rapidly; by 1989 it is over \$47 billion, roughly twice its level in 1982. Although Poland pays no debt service in this scenario, debt service ratios were calculated on the basis of debt service owed. These ratios are almost twice as high as those recorded in the initial scenario. Debt export ratios are also double their levels in the initial scenario.

According to these projections, Poland will fail to restore its creditworthiness in the 1980s even in the case of successful economic reform. Although projections stop in 1989, debt and export data indicate that Poland's lack of creditworthiness will continue into the 1990s. The small reductions in debt in the 1980s imply interest payments will remain high and principal payments falling due from loans rescheduled in the early 1980s will strain the economy. Poland's international credit standing is unlikely to improve in the foreseeable future.

OUTPUT

Muddling Through. Output projections in the initial scenario paint a bleak picture of Poland's economic future (Tables 4 and 5). The country recovers its previous peak, registered in 1978, only in 1988; and utilized national income remains below its former peak until 1989. The primary cause of this gloomy state of affairs is the shortage of hard currency imports and the burden of servicing external debt.

If this scenario comes to pass, the Polish leadership will be under tremendous pressure to improve the efficiency of the economy. Past attempts to pursue growth by means of increasing supplies of factor inputs will not be an option. This may augur a pragmatic approach to private agriculture and small scale industry and a continuation of the economic reforms. Attempts to reinstitute the former system of central planning as was done in Czechoslovakia after 1968 would be extremely costly.

percent greater in nominal terms and hard currency imports 28 percent greater than in the base case, and debt export and debt service ratios decline. Nonetheless, these ratios, especially the debt export ratio, remain high by international standards. Even by the end of the period Poland is still far from regaining solvency.

Moratorium. Despite the moratorium on debt service on guaranteed loans, Poland's hard currency balance of payments continues to show substantial deficits in net compressible import capacity. Somewhat surprisingly, in 1989 it is lower than it is in the base case. Although Poland's balance for compressible imports is higher, the increased interest payments owed by Poland because of its moratorium on debt service on guaranteed debt more than offset the net principal payments made in other scenarios.

The moratorium does lead to a marked improvement in its debt service ratios. In the first years of this scenario these ratios are half the levels of the base case. Debt to export ratios deteriorate, however, compared with the initial scenario. Moreover, neither of the two ratios approach levels considered acceptable by international bankers. Even if one discounted the unfavorable effect on Poland's creditworthiness of a continued moratorium on these debt service payments, Poland would still not greatly improve its external accounts even if all of its hard currency earnings were devoted solely to servicing debt owed to Western banks and non-Western governments.

Default. Balance of payments projections in the case of total default are grim. If in 1989 Poland attempted to pay only interest on its debt, it would face a bill for \$4.5 billion. Net compressible import capacity would be in deficit by over \$8 billion, almost three times the level in the base case. The projected level of imports would be only one-quarter of noncompressible levels. Even if the Poles continued their moratorium on interest payments in 1989, their balance of payments would still be in poor shape. Net compressible import capacity in this case would still be -\$3770 million, resulting in a deficit more than \$750 million larger than in the initial scenario. Under the assumptions employed, default dramatically worsens Poland's balance of payments.

(Appendix B).

Some improvement occurs in debt service and debt export ratios. Although in no year do debt service ratios fall below .25, after 1986 this indicator is substantially below the levels in the base case (Table 4). Debt to export ratios also show some improvement, but still remain very high, over 2 for almost the entire period. Despite substantially greater nominal hard currency earnings (32 percent) in this scenario, Poland still will not have restored its creditworthiness by 1989.

No Soviet Trade Deficit. Because of previous reductions in Poland's trade deficit with the Soviet Union in 1982 and 1983, the effect on net compressible import capacity of closing the deficit in 1985 is quite small. In this scenario hard currency exports are \$180 million less in 1989 than in the base case (Table 1). This is assumed not to affect Poland's payments of interest and principal, but results in a drop in hard currency imports, 2-3 percent less than in the base case. In Poland's straitened financial condition, the fall in hard currency exports projected in this scenario would be damaging, but would not make a qualitative difference in Poland's external imbalance, because of the country's other severe financial problems.

Debt service and debt export ratios worsen somewhat, but not substantially: In 1985 the debt service ratio increases from .65 in the base case to .66 and the debt export ratio rises from 3.91 to 4.00. Because these ratios were already extremely high in the base case, the deterioration caused by the elimination of the trade deficit with the Soviet Union would have only a minor effect on Poland's creditworthiness.

Reconciliation. Despite the additional burden of paying interest on the new loan contracted in 1985, this scenario is more favorable for Poland than the initial scenario. In 1989, the deficit in net compressible import capacity in 1989 shrinks to \$1720 million; this is over \$1 billion less than in the base case, but is substantially less than the \$950 million surplus recorded in the reform scenario. Net hard currency debt is about 10 percent greater in this scenario, but by increasing the debt, the Polish authorities are able to substantially increase hard currency exports and imports. By 1989 exports are 14

Debt service ratios, although declining, remain well above the ranges considered acceptable by international bankers. The ratio for 1984 indicates that debt service obligations will exceed hard currency exports by over two times; this is an extraordinarily high ratio. Debt export ratios decline throughout the period of analysis but still remain higher than current ratios for major Latin American borrowers.²²

Successful Economic Reform. If the Polish authorities succeed in increasing hard currency exports at the rates assumed in the reform scenario, the hard currency balance of payments pressures on the Polish economy will be greatly eased by 1989. Increased export earnings will reduce the deficit on the balance for compressible imports by almost \$4 billion in comparison with the initial scenario, permitting imports to be increased by the same amount or a commensurate decline in hard currency debt.

If Poland's lenders permit Poland to continue to reschedule its loans, the deficit in net compressible import capacity will be replaced by a surplus of almost \$1 billion. The switch from deficit to surplus would occur only in 1989, however; scenario projections still show a deficit in net compressible import capacity of \$750 million in 1988.

Table 3

POLISH DEBT EXPORT RATIOS

Year	SCENARIOS					
	Initial	Reform	No Soviet Deficit Case	Reconciliation	Moratorium Scenario	Default Scenario
1985	3.91	3.80	4.00	4.19	3.96	6.55
1986	3.49	3.19	3.57	3.65	3.73	6.49
1987	3.10	2.65	3.16	3.17	3.49	6.40
1988	2.74	2.20	2.78	2.73	3.25	6.26
1989	2.39	1.80	2.42	2.33	2.86	6.12

²²In December 1982, Mexico and Brazil had debt export ratios of roughly 2.7. "The IMF and Latin America," *The Economist*, Vol. 285, #7267, 11 December 1982, p. 69.

for the 1970s as a whole (6.9 percent).²¹ Although the rate of increase is high for Poland, historically speaking, it appears feasible considering that the base for the projections is the level of exports in 1983, which was about 12 percent less than the level in 1980.

The balance for noncompressible imports indicates that Poland will continue to face very severe balance of payments constraints through 1989. If Poland covered all its principal and interest obligations in 1989 and was unable to borrow, projected hard currency earnings would allow for imports of only \$4040 million in nominal terms; in real terms this figure is one-third less than the 1983 figure. In 1983 the Polish authorities believed that the lack of hard currency imports was the greatest stumbling block to continuing the economic recovery; if imports could not be increased, output would stagnate or begin to fall once more. Therefore, if Poland were unable to roll over principal in 1989, the country would suffer economic collapse or, more probably, would refuse to pay the loans. In other words, most of Polish loans coming due in 1989 will still be uncollectable.

Table 2
POLISH DEBT SERVICE RATIOS

Year	SCENARIOS						Default Scenario
	Initial	Reform	No Soviet Deficit Case	Reconciliation	Moratorium(a)	Scenario	
1985	.65	.63	.66	.63	.38		1.04
1986	.66	.60	.67	.66	.38		1.07
1987	.55	.47	.56	.54	.34		.96
1988	.49	.39	.49	.47	.30		.91
1989	.66	.50	.67	.61	.47		1.22

(a) These figures exclude interest owed, but not paid.

²¹Glowny Urzad Statystyczny, *Rocznik Statystyczny Handlu Zagranicznego (RSHZ)*, Glowny Urzad Statystyczny, Warsaw, various years.

Table 1
POLISH BALANCE OF PAYMENTS
PROJECTIONS IN 1989
(Millions of \$ U.S.)

	Initial	Reform	No Soviet Deficit Case	Reconciliation	Moratorium Scenario	Default Scenario
Total Hard Currency Revenue	12040	15920	11860	13540	12040	7720
Exports of coal	2550	--	2550	--	2550	1710
Other merchandise exports	8970	--	8790	--	8970	6010
Total exports	11520	15400	11340	13020	11520	7720
Net services and transfers	520	520	520	520	520	0
Total Noncompressible Expenditures	-19490	-19490	-19490	-19780	-17160	-15940
Grain imports	-770	-770	-770	-770	-770	-770
Other noncompressible imports	-10720	-10720	-10720	-10720	-10720	-10720
Total noncompressible imports	-11490	-11490	-11490	-11490	-11490	-11490
Net interest paid	-3020	-3020	-3020	-3310	-3560	-4450
Amortization	-4980	-4980	-4980	-4980	-2110	0
Total imports (estimated)	-8560	-12430	-8380	-9780	-8300	-3270
Balance for compressible imports	-7450	-3570	-7630	-6240	-5120	-8220
Policy Response Rescheduling	4520	4520	4520	4520	1940	0
Net Compressible Import Capacity	-2930	950	-3110	-1720	-3180	-8220

loan. To judge the consequences of this decision for the long term balance of payments Poland is assumed to pay interest due in 1989 but no principal.

All other assumptions in this scenario are the same as in the base case except for hard currency earnings. Poland's creditors are assumed to retaliate by seizing all Polish foreign assets and by creating trade barriers for Polish exports. Poland's commercial fleet is assumed to be confined to CMEA trade or is sequestered by its creditors so net hard currency earnings from services are zero. Hard currency exports are assumed to drop to two-thirds of the levels recorded in the initial scenario. This figure was adopted because real Polish exports to the United States plummeted to this level in 1982. Although the decline in exports to the United States cannot be entirely attributed to the imposition of sanctions,¹⁸ this figure provides a somewhat plausible guide to the effect of market economy sanctions against Poland.

CREDITWORTHINESS PROJECTIONS

Hard currency balance of payments projections for 1989 for the six scenarios are shown in Table 1.¹⁹ Tables 2 and 3 present projections of debt service and debt export ratios. In all cases, projections for Polish creditworthiness as reflected in net compressible import capacity indicate a bleak period. Only in the Successful Reform Scenario does Poland record a surplus in net compressible import capacity by the end of the decade, but even in this scenario debt service and debt export ratios remain above creditworthy levels.²⁰

Muddling Through. According to the projection for the first scenario real hard currency earnings are to increase at an average annual rate of 8.1 percent. This is less than the rate Poland achieved during the first half of the 1970s (8.5 percent), but exceeds the rate

¹⁸The decline in Polish exports to the United States in 1982 was also a consequence of the U.S. recession and supply difficulties facing Polish exporters. However, it was greater than the decline of Polish hard currency exports as a whole.

¹⁹The figures for projections of exports, imports and net compressible import capacity for the 1985-1989 period are given in Appendix B.

²⁰Debt service ratios of over .25 are considered grounds for alarm.

Scenario 6: Default on All Hard Currency Debt

After the imposition of martial law in December 1981 the pros and cons of declaring Poland in default were debated in the United States.¹⁵ At that time the U.S. government, which among all of the governments with loans or guarantees on outstanding loans to Poland considered the option most seriously, decided against declaring the country in default. Since then little discussion has been devoted to this policy option in the West, and among government officials who deal with the problem it is generally considered to be a counterproductive policy.

Some policymakers in Poland, however, have recently resurrected the idea. Stanislaw Dlugosz, an under secretary in the Polish Planning Commission, declared in an article in a major Polish economics weekly that "convertible currency funds earmarked for servicing Poland's foreign debt should be minimized over the next 5-7 years."¹⁶ Dlugosz was sharply criticized in an article by Kazimierz Glazewski, chairman of Bank Handlowy, which stated that Poland has done extremely well in rescheduling negotiations, obtaining terms superior to those given to Brazil, and that Poland will continue to try to set its financial house in order.¹⁷ Western bankers generally concur that the Polish government is now taking its hard currency debts seriously and that those in command have no interest in total default. They point out it has faithfully upheld its commitments under the rescheduling agreements reached on unguaranteed loans.

This scenario explores the consequences of Dlugosz's suggestion. Poland is assumed to declare a moratorium on payments of both principal and interest on all its hard currency loans. Unpaid principal and interest are assumed to be capitalized by Poland's creditors and interest is charged on these "loans" at the same rate as the original

¹⁵Rohatyn, Felix, "We Cannot Create a Municipal Assistance Corporation for Poland. Let It Go Bankrupt," *New York Times*, Vol. 131, #45190, 11 January 1982, p. A18.

¹⁶Dlugosz, Stanislaw, "The Dilemmas of Foreign Debt," *Zycie Gospodarcze*, #50, 11 December 1983, p. 15.

¹⁷Glazewski, Kazimierz, "The Dilemmas of Pessimism," *Zycie Gospodarcze*, #2, 8 January 1984, p. 11.

dealing with over \$9.4 billion of unpaid principal. On the other hand, Polish debt service arrears exacerbated already strained relations with its Western trading partners and made it necessary for Poland to conduct much of its trade on a cash basis, as international lenders have been loath to advance trade credits due to Poland's poor payment record.

The purpose of this scenario is to assess the advantages and disadvantages for both the West and Poland of a continuation of Poland's past policy of refusing to honor its financial obligations to other governments. It attempts to measure Poland's incentives to break the terms of its agreement with its creditors in the Paris Club.

Assumptions concerning hard currency exports, noncompressible imports, and interest rates remain the same in this scenario as in the base case. Assumptions concerning interest and principal payments change in the following manner:

- The Poles break the terms of their agreement with the Paris Club and refuse to pay either interest or principal on guaranteed Western debt until 1989, at which time they begin to make interest payments. Interest and principal arrears are assumed to be capitalized annually with interest accruing on the capitalized arrears at the same rate as on the original loan.
- Because of Soviet pressure and the Polish leadership's determination to better relations with its bankers and Third World countries, debts owed to these countries--primarily Arab oil states, Brazil, Argentina, and the Soviet Union--and private banks are assumed to be rescheduled as in the base case.

Western governments are assumed not to place additional sanctions on the Poles. Western governments did not respond to Poland's past refusal to pay up, so they may also not retaliate in the future.

also modified their positions. They have returned to the bargaining table to discuss rescheduling; the United States has dropped some strictures on Polish use of American fishing grounds and has agreed to negotiate the restoration of Polish landing rights and scientific exchanges. The U.S. has also recently dropped its opposition to Polish entry into the International Monetary Fund.

This scenario examines the extent of the potential economic benefits to the West and to Poland, if the West and Poland are reconciled. The scenario is constructed under the following assumptions:

- In addition to rescheduling all guaranteed loans, the West or the IMF advances a new loan for one time only that would allow Poland to purchase enough imports to close the noncompressible import gap in 1985 (\$1800 million).¹²
- The new loan allows Poland to increase imports enabling the country to expand hard currency exports in 1985 by 16.8 percent in real terms.¹³
- After 1984 exports grow at the average rate projected in the initial scenario (8.1 percent per year).

Scenario 5: Moratorium on Servicing Guaranteed Debt

After the declaration of martial law in Poland and the subsequent imposition of Western sanctions, the Polish government made no attempt to honor its debts to Western governments until 1984. Third World governments, most notably Brazil and Argentina, although not participating in the sanctions, also found it difficult to compel the Poles to pay either interest or principal due. On the one hand, this state of affairs had obvious advantages for Poland, which avoided paying the large interest payments due¹⁴ and also avoided the problem of

¹² These assumptions are similar to Polish expectations for "new" money forthcoming after the completion of the 1985 rescheduling agreement with Western governments and entry into the IMF.

¹³The increase projected by the Polish Planning Commission for 1984 given a sizable increase in hard currency imports is 16.8 percent.

¹⁴The Polish government estimates their current arrears on interest at \$2.8 billion.

Polish planners because they projected a trade deficit double in size in the national plan.¹⁰ It appears that the Soviets have decided that economic aid can safely be cut as long as political unrest has been reduced.

This scenario assumes that the Soviet Union and Poland's other CMEA trading partners force Poland to balance trade by 1985, instead of 1988. To close the trade deficit, Poland increases exports by diverting hard currency exports to the Soviet Union (one third of the total) and by reducing domestic consumption (the rest). The contributions of each source of additional exports were determined by the composition of Polish exports to socialist countries in 1983, one third of which consist of hard goods--raw materials, food, etc.--assumed to be diverted from Western exports, and two-thirds of soft goods--machinery and light industrial products--assumed to come from domestic consumption.¹¹

Scenario 4: Reconciliation Between Poland and the West

On 24 December 1981, President Reagan imposed economic sanctions on Poland, including revocation of U.S. landing privileges for Polish aircraft, expulsion of the Polish shipping fleet from U.S. waters, loss of access to further U.S. government-backed export credits, and a refusal to discuss renegotiation of Poland's outstanding debt. Several heads of other NATO countries subsequently adopted other sanctions in January 1982, the most notable of which was an agreement to halt negotiations on rescheduling Polish hard currency debt. Three preconditions were set for the removal of these sanctions: repeal of martial law, freedom for all political prisoners, and a resumption of a dialogue between the government and Solidarity.

To this point the Polish government has publicly refused to bow to Western pressure, yet has partially fulfilled some of the West's conditions: Martial law has been repealed in letter, if not in spirit, and many political prisoners have been freed. Western governments have

¹⁰The planned deficit was 1190 million transferable rubles, the actual deficit was less than 600 million rubles. "Handel Zagraniczny '83," *Zycie Gospodarcze*, No. 6, 5 February 1984, p. 8.

¹¹Glowny Urzad Statystyczny, *Maly Rocznik Statystyczny (MRS)*, Glowny Urzad Statystyczny, Warsaw, 1983.

in its interest to bite the bullet now, rather than continue to postpone its debt problems.

Default. Despite the removal of the burden of servicing the debt, net material product projections are less in this scenario than in the base case for every year except 1986. The projection for 1989, which was made under the assumption that Poland would pay interest due in that year, is 15 percent below the projection in the base case. Projections for other years are only a few percent below those in the initial scenario. Polish officials advocating default to give the Polish economy time to recover are probably sanguine. The resulting financial upheaval would eliminate any large increases in output that could be expected from eliminating debt service payments.

Default does buy short run increases in consumption. In some years UNI projections are substantially above the levels of the initial scenario. Yet even in this scenario UNI levels never attain the 1979 level. Under the assumptions of this scenario the Polish government would achieve the same results as did the Gierek administration in the late 1970s: slight increases in living standards or stagnation at the price of an enormous increase in hard currency debt.

In short, output recovers from the low point of 1982 in all the scenarios; in the initial scenario it increases by 4.6 percent per year. UNI also increases, but at a slower rate, and declines in some years. Although increasing the percentage of national income invested or more rapid factor productivity growth could lead to larger increases in output, the primary constraint on increasing national income is the dearth of hard currency imports. According to these projections Poland faces a bleak period in which output and consumption levels remain below those of the late 1970s for most of the rest of the decade.

III. THE OUTLOOK FOR POLAND--POLICY OPTIONS

The purpose of this paper has been to capture the main alternatives open to Poland and its debtors for eventually resolving the debt crisis. Although both the Soviet Union and the West possess the power to alter the conditions under which the Poles handle their debt problems, ultimately it is the Polish government which will make the decisions on when and how Poland will service its debts. Various policy options open to the Poles and the implications for a resolution of their debt problems are discussed below.

DOMESTIC POLICY OPTIONS

Practically speaking, the government has two domestic policy options: "muddling through" as described in the initial scenario and aggressive pursuit of economic liberalization as discussed in the reform scenario. Retreat to the prereform system is not considered a tenable option.¹

The base case, "muddling through," is the one currently pursued by the Polish government. It can be described in the same terms that have been used to criticize the Hungarian reform: neither plan nor market.² Although the present system is probably superior to the old, it is not an attractive solution to Poland's economic problems according to these projections. Given the government's continued timidity in increasing prices of consumer basics and providing enterprises more independence, "muddling through" is probably the policy of the future, however.

¹The Polish Council of Ministers and the Party apparatus have repeatedly criticized the old economic system and have insisted that a retreat from the reform is not possible. Although the creation of economic associations in place of the old trusts and the introduction of target programs in the first two years of the reform indicate that many elements of the old system have crept into the new, the elimination of compulsory plan targets in 1982 and most of the target programs in 1984 coupled with the new body of law delineating the rights of enterprises and workers' councils would make a return to the old system of central planning difficult.

²Bauer, Tamas, "The Hungarian Alternative to Soviet-Type Planning," *Journal of Comparative Economics*, No. 3, September 1983, p. 304.

The second option, captured in the reform scenario, is to pursue economic liberalization. Of the scenarios, it provides the only feasible avenue to rapid increases in output, consumption, and exports. Unfortunately, opposition from Party and governmental bureaucrats and trade union opposition to flexible prices have stymied the reform. Currently, those fighting for a more rational economic system appear to be losing the battle. However, a renewed commitment on the part of the central leadership could breath new life into the reform.

FOREIGN POLICY OPTIONS

Poland faces several foreign policy options, all of which are consistent with the two domestic options listed above. The first option, the one most often espoused by government leaders, is to redirect trade to the CMEA; it also appears to be the least tenable from an economic point of view. Most of Poland's imports from the West consist of raw materials, components, and machinery not available from its CMEA partners or sold by them only for hard currency. Consequently, increased CMEA imports have not been able to substitute for hard currency imports. Furthermore, despite claims to the contrary, Poland is redirecting exports away from rather than to the CMEA. In 1983, in real terms, exports to nonsocialist countries increased at twice the rate of exports to socialist countries. Although imports from the West are a smaller percentage of total Polish imports than they were in the mid-1970s, these imports are now being purchased for cash, not credit, and increases in these imports have been identified as the key to economic growth in the 1984 plan. Despite the rhetoric, the Polish authorities have given priority to increasing hard currency exports in the 1984 plan because these exports are needed to service the debt and to pay for imports.

A second option is formal default. The Polish authorities have yet to find this attractive. In the default and moratorium scenarios Poland gains little in terms of increased output. Although consumption and investment are higher than the base case projections for most of the period, the long-run consequences of either of these policies appear to be the same as the policies of the Gierek era--an unsustainable increase in debt and economic decline.

Another option, as discussed in the fourth scenario, is for the government to push for a reconciliation with the West through greater domestic political liberalization. The repeal of martial law, amnesty for Solidarity supporters, and other measures consistent with a greater regard for human rights have been partly directed towards meeting the terms for the removal of Western sanctions but also towards placating the populace, and possibly, to give the lie to Western criticisms of Polish violations of human rights. Renewed Polish pressure for readmission to the IMF indicates this may be the government's preferred policy. The projections indicate it would be a beneficial one.

The problem with this scenario is that substantial new loans from the West will depend on better political relations and, probably, IMF approval of Poland's economic program. Poland has made some progress in the former area, but harrassment of U.S. diplomatic representatives in Poland indicates that some sections of the Polish government are not interested in reconciliation. More importantly, the Poles have consistently emphasized increases in domestic consumption at the expense of balancing the current account. As long as these policy goals dominate, there is little likelihood that Poland will adhere to any stabilization program that the IMF would certify. This being the case, prospects of significant progress toward improving Poland's finances are limited.

The fourth option is reschedulings with Western bankers and some sort of agreement with Western governments. This policy is assumed to be followed in most of the scenarios. Poland does not regain its creditworthiness, but by 1989 its economic position is better than in the case of default or a continued moratorium on guaranteed debt payments. In other words, "muddling through" is the order of the day.

APPENDIX A THE OUTPUT MODEL

This is a sectoral model where:

$$(1) NMP = IO + TRANS + TRADE + AG + FOR + CON + OTH$$

where IO is net industrial output, TRANS, net output of the transportation and communications sector, TRADE, output of the commercial sector, AG, agricultural output, FOR, forestry output, CON, output of the construction sector and OTH, other sectors.

IO was assumed to be determined by the availability of factor inputs, TRADE, TRANS and OTH, by demand for these services from industry. Consequently, the equations for these outputs (given below) were estimated using two-stage least squares. The coefficients for capital and manhours worked in equation (2) were constrained to equal 1. T statistics are in parentheses. Data series extended from 1960 to 1980.

$$(2) \log(IO) = -1.54 + .2 \times \log(\text{Capital}) + .605 \times \log(\text{Manhours Worked})$$

(-3.1) (1.94) (5.84)

$$+ .195 \times \log(MD) + .032 \times \text{TIME}$$

(4.82) (4.34)

$$(3) \log(TRANS) = -1.76 + .978 \times \log(IO)$$

(-14.9) (51.1)

$$(4) \log(TRADE) = -.721 + .873 \times \log(IO)$$

(-3.05) (22.7)

$$(5) \log(OTH) = -4.2 + 1.156 \times \log(IO)$$

(17.8) (30.2)

Construction output was assumed to be determined by supply side constraints: man hours worked and gross output of the construction materials industry. Two stage least squares were used to estimate equations for both sectors.

$$(6) \log(CONMAT) = -11.66 + 1.03 \times \log(\text{Gross Fixed Assets})$$

(-14.4) (48.7)

$$+ 1.878 \times \log(\text{Manhours Worked})$$

(15.87)

$$(7) \log(\text{CON}) = -12.27 + .637 \times \log(\text{CONMAT}) \\ (-25.4) \quad (13.7) \\ + 1.419 \times \log(\text{Manhours Worked in Construction}) \\ (11.5)$$

where CONMAT is gross output of the construction materials sector.

Because of the vagaries of Polish agricultural policies and the weather, no equation was estimated for agriculture. Net output was assumed to increase at the rate posited in the 1983-85 plan (2.9 percent per year). Net output of forestry was assumed to remain at the same level as it has for the past ten years.

Projections were made using the hard currency import data generated by the balance of payments projections, labor force data from the Foreign Demographic Analysis Division of the U.S. Department of Commerce and under the assumption that net investment will constitute a fixed percentage of UNI between 1985 and 1989. Further details concerning the data employed are available in Keith Crane, *The Creditworthiness of Eastern Europe in the 1980s*, R-3201, Santa Monica, The Rand Corporation, 1985.

Table 6

Simulation Results

Muddling Through						Reform Scenario						
Year	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports With Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling
1985	7587.5	-1991.8	6916.60	7803.7	-1775.7	7132.7	7410.4	-6.5	8901.96	7410.4	-6.5	8901.96
1986	8437.6	-4309.1	5091.31	9248.4	-3498.3	5902.1	8260.5	-4180.9	5219.51	8260.5	-4180.9	5219.51
1987	9460.3	-3856.7	6167.88	11046.9	-2270.2	7754.4	9283.2	-3435.4	6589.23	9283.2	-3435.4	6589.23
1988	10664.8	-3348.3	7387.02	13259.2	-753.9	9981.4	10487.7	-2567.1	8168.18	10487.7	-2567.1	8168.18
1989	12036.9	-2933.8	8555.29	15916.7	945.9	12435.1	11859.8	-1711.9	9777.25	11859.8	-1711.9	9777.25
No Soviet Trade Deficit Scenario												
Year	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports With Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling
1985	7410.4	-2169.0	6739.48	7772.9	-6.5	8901.96	8260.5	-4180.9	5219.51	8260.5	-4180.9	5219.51
1986	8260.5	-4486.2	4914.19	8860.3	-4180.9	5219.51	9283.2	-3435.4	6589.23	9283.2	-3435.4	6589.23
1987	9283.2	-4033.9	5990.76	10176.2	-2567.1	8168.18	10487.7	-1711.9	9777.25	10487.7	-1711.9	9777.25
1988	10487.7	-3525.4	7209.90	11740.5	-2567.1	8168.18	11859.8	-1711.9	9777.25	11859.8	-1711.9	9777.25
1989	11859.8	-3110.9	8378.18	13544.7	-1711.9	9777.25						
Moratorium Scenario												
Year	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports With Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling	Nominal Hard Currency Earnings	Net Compressible Import Capacity	Expected Imports with Rescheduling
1985	7587.5	-1791.8	7116.65	4815.65	-4092.8	4815.65	8437.6	-2792.1	5371.80	8437.6	-2792.1	5371.80
1986	8437.6	-2792.1	6608.28	6036.91	-4028.6	6036.91	9460.3	-2384.0	6823.83	9460.3	-2384.0	6823.83
1987	9460.3	-2384.0	7640.64	6823.83	-3987.7	6036.91	10664.8	-1883.0	7716.33	10664.8	-1883.0	6036.91
1988	10664.8	-1883.0	8852.32	7716.33	-3911.5	6823.83	12036.9	-3187.4	-8219.2	12036.9	-3187.4	3269.91
1989	12036.9	-3187.4	8301.67									

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